GAS JOURNAL, OCT. 30, 1940

VOL. 232 92nd YEAR No. 4041

As we announced last week, we have now moved our central organization to our country offices, and we shall be grateful if all whom it may concern will kindly treat it as a matter of urgency to note the change of address in their records. Will readers also please excuse the absence of editorial comment, and any other changes in the make-up during the transition period? We shall endeavour to maintain a skeleton staff at 11, Bolt Court. Delays will be obviated if all communications are from now on addressed to :—

51, HIGH STREET, ESHER, SURREY (Telephone : Esher 1142)

Personal

At a meeting of Perth Town Council, on Oct. 21, Mr. W. NICOL BAIRD, B.Sc., Deputy Engineer and Manager to the Dunfermline Gas Department, was appointed Engineer and Manager at Perth in succession to Mr. A. C. Rea. Mr. Baird, who is 33 years of age, started his career at the Granton Gas-Works of the Edinburgh Corporation, where he received five years' practical training in the several departments, including the laboratory, engineering workshops and drawing office. An Associate Member of The Institution of Gas Engineers, he graduated from Edinburgh University with First-class Honours in mechanical engineering. He is an Associate Member of the Institution of Mechanical Engineers. After serving at H.M. Fuel Research Station in London, he was appointed to Dunfermline five years ago. Mr. Baird is President of the Eastern District of the Scottish Junior Gas Association.

* * *

Mr. G. A. BENTLEY, Technical Assistant to Mr. J. Corrigan, Engineer and Manager of the Brighouse Corporation Gas Department, has taken up duties on his appointment as Assistant Engineer to the Elland-cum-Greetland Gas Company.

* * *

Mr. F. S. DOWNS, Assistant Engineer to the Bishops Stortford, Epping, and District Gas Company, has been appointed Deputy Engineer and Manager of the Solihull Gas Company. Mr. Downs received his early training with the Woodall-Duckham Company, and was subsequently Technical Assistant to the Shipley Urban District Council Gas Department.

* * *

Mr. A. W. ELLIOTT, at present Assistant Engineer and Manager at Stockport, is to succeed Mr. F. G. SYMON as Assistant Engineer and Manager at Stretford. Mr. Symon has left to take up a similar appointment at Reading.

* * *

Mr. A. R. TOWNLEY, son of Mr. Arthur Townley, Managing Director of the Underpressure Engineering Co., Ltd., has been granted a Commission in the Royal Artillery. Mr. Townley was a sapper in the Territorial R.E. before the war, and has seen much service on the East Coast in the past year. Before joining up he was London District Representative of the Underpressure Company.

Obituary

The death has taken place at Darlington of Mr. ERNEST MILWARD, a Director of Messrs. Pease and Partners and associated concerns. Mr. Milward had been Manager of the firm's collieries in Durham and Yorkshire for several years, and before then was with the Wigan Coal Co., as Chief Mining Engineer. In recent years he also had charge of Pease and Partners' coke ovens, by-product plants, and ironstone quarries.

* * *

Formerly Secretary of the Scarborough Gas Company, Mr. JOHN W. NALTON died on Oct. 19. He had served the Company for 40 years, having been appointed Accountant and Cashier in 1904, later becoming Assistant Secretary and ultimately Secretary. The Directors of the Gas Company and his former colleagues were represented at the funeral, together with members of a very wide circle of friends, which testified to his popularity in many spheres of activity.

Institution of Gas Engineers

The Council of The Institution of Gas Engineers is finding, in the conduct of the affairs of the Institution during the existing war conditions, that strict compliance with certain of its By-laws would not always be in the best interests of the Institution and its members and may indeed become impossible.

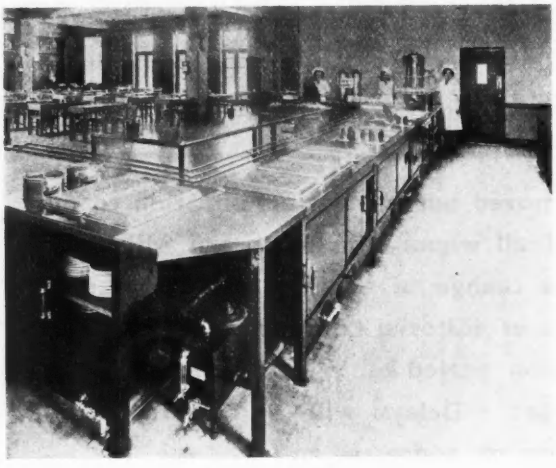
The By-laws of Chartered Institutions have been drawn up in the light of normal peace conditions and are not in general sufficiently elastic to cover all the contingencies that may arise under exceptional circumstances such as those through which we are at present passing. This was recognized by the Privy Council soon after the outbreak of hostilities, and to meet the position the Chartered and Other Bodies (Temporary Provisions) Act, 1939, was passed, whereby the Lord President of the Council is authorized to give directions for modifying temporarily the provisions of any By-laws of a corporation incorporated by Royal Charter, if he is satisfied that such directions are " necessary or expedient for the purpose of securing economy or efficiency in the carrying on of the work of the corporation under war conditions."

While the Council of the Institution of Gas Engineers naturally wishes to make as little use as possible of any special concessions granted in this way, it has deemed it wise to obtain permission to modify the By-laws in one or two respects, if thought desirable during the period of the war, notably in regard to the holding of the Annual General Meeting and to the election of Officers and Members of Council.

The Council, at its last meeting held on Oct. 8, after a careful review of the existing position, agreed that it would be in the best interests of the Institution to make certain temporary departures, within the above-mentioned provisions, from the normal procedure in the current year. The Council accordingly resolved—(1) That the holding of the 77th Annual General Meeting of the Institution be further postponed. (2) That the scrutiny of the Ballot for Election of Officers, Council and Auditors, held in June, 1940, be further postponed. (3) That the present Officers, Council and Auditors continue to hold office for a further period not extending beyond June 30, 1941. (4) That a Ballot for Election of Officers, Council, and Auditors be completed not later than June 30, 1941.

GAS KITCHEN AND CAFETERIA at MILK MARKETING BOARD

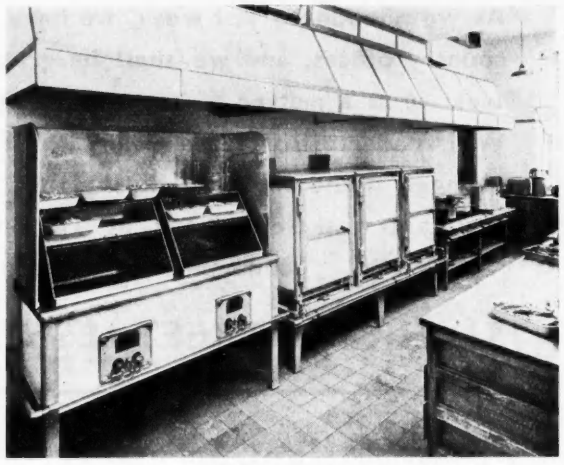
For the new Headquarters of the Milk Marketing Board at Thames Ditton the Wandsworth and District Gas Company has installed an excellent kitchen and cafeteria designed and manufactured by Radiation Limited.



Cafeteria Counter.

THE equipment consists of three No. 3324 roasting ovens mounted as a battery, a No. 757 " Chester " boiling table, a No. 23 " Wardour " fish-fryer, two 30-gallon " Lune " vegetable boilers, a No. 58 vegetable steamer, and a No. 27 " Savoy " griller. All these appliances are in " Radar " vitreous enamel finish. The glazed canopy and ventilating arrangements were also supplied by Radiation Limited.

On the service side is a cafeteria counter having 25 ft. long centre section, and two return ends each 10 ft. 6 in. long. The top is covered in stainless steel, and hotclosets are provided below. Along the top of the cafeteria counter are sunk vessels for holding soups, vegetables, and sweets. There are also dishes for entrees, and at the end is a large boiler for hot water, from which urns on trolleys and individual teapots are filled ; close to this is a milk urn and a separate coffee urn.



Some of the Kitchen Equipment.

The kitchen can cater for 800 people, but the dining-room is arranged to seat approximately 250 people at one time. This allows a good margin, and in view of the speed and continuity of cooking by gas, meals could be provided continuously should this be necessary.

The Architect was Mr. Kenneth S. Layton, M.Inst.R.A., F.F.A.S.

Gas-Works Extensions at Johannesburg

Tenders Invited

His Majesty's Trade Commissioner at Johannesburg reports that the Johannesburg City Council is calling for tenders (Contract No. 682) for the supply, delivery and erection at the Gas-Works, Cottesloe, of an extension to the existing gas-works plant.

Tenders endorsed " Contract No. 682—Gas-Works Plant Extension " should be addressed to the Town Clerk, Municipal Offices, Johannesburg, South Africa, by whom they will be received up to noon on Saturday, Jan. 4, 1941. Local representation is essential.

A copy of the specification and general conditions of tender, together with drawings are available for loan from the Department of Overseas Trade. All telephonic communications with the Department of Overseas Trade in regard to this tender should be addressed exclusively to Extension 558.

Edinburgh Gas Department's Gift for Troops

At a recent meeting of the Edinburgh Public Utilities Committee it was decided to give a contribution of £2,000 from the Edinburgh Gas Department to the Lord Provost's Fund for the purpose of providing entertainment and comforts for the troops quartered in the city.

It was explained by Treasurer Darling that when he tried to encourage citizens to contribute to various war funds he was met with the question, " What is the city doing ? " Accordingly, he supported the proposal because it would demonstrate that municipal undertakings could meet the same demands as private enterprise and stand the strain. Councillor Baird, who presided, moved approval of the contribution, and Councillor Brown, in seconding, stated that Edinburgh gas was still among the cheapest in the country.

Screw Thread Gauge Tolerances

Some weeks ago we published a Notice relating to the recently issued British Standard 919 for Screw Thread Gauge Tolerances. We are advised that the tolerances recommended in this Specification were formulated in co-operation with the National Physical Laboratory and during the period of the war the National Physical Laboratory has agreed to test screw gauges in accordance with this British Standard in cases where it differs from the current practice of the Laboratory, unless instructed otherwise.

Cookery Book's Red Cross Contribution

A contribution of £100 has been made to the Lord Mayor's Red Cross Fund as a result of the sales of " A Kitchen goes to War," the collection of famous people's favourite wartime recipes, gathered together by the Gas Industry and published by John Miles Limited. The publishers arranged that a royalty on each copy sold should go to war charities.

So Successful have experiments proved with the Burnley, Colne, and Nelson Joint Transport Board conducted with a gas-driven bus, that it has now been decided to extend the experiment. When Mr. H. Broughton, the General Manager of the undertaking, reported to the Committee last week on the results of the experiment, he was authorized to equip seven more single-decker buses to operate on gas. Thus all the single-decker buses in Burnley will shortly be gas-driven. Further developments may be expected in the near future.

GAS COMPANY CO-OPERATES IN REDDITCH FOOD WEEK

A section of the Exhibition organized by Mrs. O. Vaun Roberts, Home Service Adviser to the Redditch Gas Company, in support of the local Food Week.

UNDER the auspices of the Redditch Higher Education Committee and the Redditch Urban District Council, an Exhibition was organized in the Temperance Hall, Worcester Road, during the week commencing Monday, Sept. 16. This Exhibition was arranged to give information for the benefit of the housewife in feeding her family in wartime. Displays of the foods which the Ministry of Food advise should be bought and every local home-grown food-stuff were shown, together with demonstrations of the preparation, cooking, preservation, and storage of the necessary Fitness Foods; also specimen shopping baskets and stores for the week, covering all types of families.

On Sunday, Sept. 15 a public meeting was held in the Danilo Cinema, when the chief speaker was Mr. Leslie R. Pym, M.P., J.P., Private Secretary to the Parliamentary Secretary to the Ministry of Food, supported by important members of the medical profession, the Education Authority, and members of the local Council.

Included in the exhibits was the complete "Protect your Homes" display from the recent London Exhibition, and information on all questions connected with Air Raid Precautions was dealt with in this section. School children gave simple demonstrations under the guidance of the Domestic Science mistresses on Children's Day. Competitions were arranged for the public, in the form of a Crossword Puzzle, and the children had essay and painting competitions, for which prizes of books were offered by the Chairman and Directors of the Redditch Gas Company. A Film Exhibition by the Ministry of Food and the Milk Publicity Council was arranged in the Danilo Cinema which school-children attended.

The total attendance for the week was 1,556—an average of 210 in the afternoons and about 50 in the evenings. The Education Committee expressed their appreciation of the valuable part played by the Redditch Gas Company.

INSTITUTE OF FUEL

PRESIDENTIAL ADDRESS

of

W. M. SELVEY, M.Inst.C.E., M.I.Mech.E.,

(Acting President, 1939–1940)

FOR some time during the President's absence across the water we have carried on the business of the Institute without any events causing apprehension. After a short evacuation of the offices, the Secretary and staff returned to Town, and at the time of writing are, like all London residents, experiencing to the full the strain of aerial warfare. But what is abundantly manifest are the bands, strong as steel, which hold the people of this country to their common ideals and to each other. This network of associations of free minds is typified in our Institution, which is holding firmly to its marked, if comparatively short tradition. During all the strain of the past year of war, new membership applications have been continually received and mostly accepted.

One might reasonably ask what is the nature of the bond which holds together minds of such a wide diversity of interests. Our title suggests it in the word "fuel." But the man in the street may object, what commoner or less interesting subject could there be than the stuff which I consume away in my fires, and the unconsumed residue of which affords me many comfortable sources of grumbling? And yet we can point out to him that our list of members, small as it is in these great days, comprises a high proportion of the principal fuel technologists; many with world-wide reputations. The most valuable goods can be done up in the smallest parcels.

But it is the diversity of interests which is most marked—coal, coke, patent fuel, electric power, town gas, producer gas, fuel oil, petrol, all have their experts among the membership. Under the aegis of the Institute many of these have come to know each other for the first time, and in other cases improvement of casual acquaintance has ripened into a community of interest. We may have considerable confidence that, come what may, there will always be the need for this common ground of meeting, and an Institute to fill the need.

The pure scientists evolve theories and hypotheses with great ingenuity, which in course of time fall and change with the evolution of knowledge brought to light by their efforts. Seldom, if ever, can they say with certainty what they went out to see, but the light which comes ever spurs them on to further efforts. This marvellous evolution of knowledge is open to all workers in all nations. But now we must pause. The implications of this knowledge belong to the realm of philosophy, but the practical applications belong to the realm of technology. It is generally, say, twenty years, and often longer, before scientific knowledge produces practical applications which enter into the common life of the community. These applications may be for good or the reverse, and of late years there has been much heart-searching among the pure scientists as to whether they are morally justified in increasing physical knowledge to be put to such dangerous uses—witness the discussion of the British Association. There seems, in my view, to be little point to this, since associations of men in the vague form of the "State" will always apply whatever is known to good or ill uses, and they can always employ technologists who will put into mass production the most deadly device obtainable. The logical outcome of this process seems to the mind of H. G. Wells to be the World State on the one hand, and the Atomic Bomb on the other.

The solution of the problem there does not seem to be along the lines of smothering the scientists, or putting the technologists on the dole, but rather in considering what sort of men shall ultimately compose that small inner coterie existing in every country which has the power and responsibility of putting these great forces into action. These men to-day are primarily educated in what used to be called the "humanities" and this form of education leads to an astute knowledge of how to govern men through their lesser qualities and, indeed, their weaknesses. The growing reaction against this form of education of our finest minds has resulted, not in changing their form of education, but in replacing them by representatives of the "people," mostly great-hearted men, but who have this in common with their colleagues of the former type—that in discussions of any grave difficulty they can always brush aside questions which demand answers by saying they are purely technical.

It is a most amazing state of affairs that in a world which is fast becoming wholly technical, the men having the power and responsibility can almost boast of their ignorance on technical questions. We

should, however, consider deeply that there are countries where the men in real power are technically trained as a basis for their future activities, educated to some degree in the scholastic field of knowledge, but totally devoid of morals when acting as functionaries of the State.

The jibe is often flung that technologists do not make successful administrators. As long as Government turns on the management of men by their foibles this will always contain an element of truth. The matter must be dealt with at an earlier stage. It is not more difficult to distinguish among young technologists than among young classical graduates what men are likely to develop into administrators. The House of Commons throws up men from widely different environments. The future may, however, demand for very existence that the early training of these men should be technological as well as or more so than humanistic, not because there is more virtue in one than the other, but because they must function in an almost wholly technological world. The virtue lies not in either form of training, but in a moral, ethical, and religious training superimposed on any form of merely materialistic or philological knowledge.

That this kind of statement is more than just a voice in the wilderness can be proved from the columns of our great national organ, *The Times*, for the past year or so. Everywhere there is a growing consciousness that something must be changed before it is safe to put further powers evolved by scientists and technologists in the hands of those governing the political fortunes of the State. But the scientists and technologists must go on. The forces which drive them almost compel the evolution of more and more knowledge, and, therefore, it must also follow that they must themselves delve deeper into those questions which they in turn have been equally amiss in shelving as political, moral, ethical and religious. We cannot perpetuate these watertight divisions of thought, action, and responsibility and continue anything remotely like the civilization which we have known or looked for in the future.

INTERIOR LIGHTING OF FACTORIES

NEW DRAFT REGULATIONS

THE Minister of Labour and National Service has had under consideration the question of lighting in factories. Experience shows that marked increases in production, as well as a reduced risk of accident and overstrain, have resulted from improvements in the lighting arrangements ; and he is advised that although there has been widespread improvement in factory lighting in recent years there are still many factories, including many engaged on work important for the prosecution of the war, in which the lighting is still unsatisfactory, either in amount or in the arrangement and shading of the lights. There are cases, too, in which improvements can be made in blackout arrangements so as to provide for the admission of more natural light in the daytime ; both this and the light colouring of walls, ceilings, &c., are material factors in preventing gloomy and depressing effects on the workpeople, with consequent impairment of efficiency.

The Departmental Committee on Lighting in Factories, on which employers and workpeople are represented, were recently asked to review in the light of war conditions the recommendations made in their Fourth Report of September, 1938 ; and they have now submitted a unanimous report* containing revised recommendations as to sufficient and suitable lighting.

On the basis of these Recommendations the Minister proposes to make Regulations under the Factories Act, 1937.† In accordance with the prescribed procedure, the Regulations are being formally published in draft so as to give an opportunity for objections and representations to be lodged and considered before the Regulations are finally made ; and any objection or representation with respect to the draft Regulations by or on behalf of any person affected thereby must be sent to the Minister within 40 days from Oct. 15, 1940. Every such objection should be in writing and be addressed to the Secretary, Ministry of Labour and National Service, Cleland House, Page Street, London, S.W. 1, and should state (A) the specific grounds of objection, and (B) the omissions, additions or modifications asked for. As, however, the draft Regulations are based on the unanimous report of the Committee above-mentioned, the Minister hopes that they will be generally accepted.

It is only proposed at present to apply the Regulations to those factories in which persons are being regularly employed in a process or processes for more than 48 working hours a week or in shifts. This does not mean that good lighting is unimportant in other factories, but in present circumstances lighting improvements may raise questions of priority of supplies ; and where the lighting is not already up to the standards of sufficiency and suitability specified in the draft Regulations its improvement is particularly important in the case of those factories in which long hours or shifts are being regularly worked—these being, broadly speaking, the factories in which work of special national importance is being done at high pressure and work is carried on to an exceptional extent by artificial light. It will be observed that the Chief Inspector would have power to grant exemptions from particular requirements of the Regulations in special cases where they are inappropriate or not reasonably practicable.

Regulation 2 would require, for interior lighting, at least 6 foot-candles in parts in which persons are regularly employed, and half a foot-candle in other parts ; but this does not mean that higher illumination need not be provided for special classes of work. The 6 foot-candle standard is based on what is now usually accepted as good illumination, enabling ordinary work to be done with ease and affording reasonable amenity to the workers affected. Provision would be made for a lower standard than 6 foot-candles in certain cases where structural difficulties are involved. Some classes of works or parts of works would be exempted ; and for other exceptional cases there would be the Chief Inspector's power of exemption mentioned above.

Many employers do not know whether their lighting provides an illumination of a specified number of foot-candles, and this cannot be accurately ascertained without a light-measuring instrument.

As regards gas, light-meter measurements will usually be necessary to check the illumination afforded.

The mere quantity of light provided from the light-source is by no means the only factor in good lighting and present conditions have emphasized the importance of relieving the effects of the blackout by light-coloured surroundings, walls, ceilings, insides of roof shutters, &c., which add to the general brightness of a room, afford an effective background to dark objects, and at the same time increase the illumination derived from a light-source of a given strength. The Factory Lighting Committee attached great importance to this, and considered that it should be much more widely adopted than at present.

Glare and the formation of objectionable shadows are common features of unsuitable lighting. There are many factories in which the illumination is sufficient in amount, but in which lights are so badly placed or shaded that the workers are exposed to conditions of glare which dazzle or strain the eyes, impair working efficiency, and increase the accident risk. Marked shadows at points near the work or across gangways, &c., may also impair efficiency and lead to accidents. Regulations are designed to secure that the lighting is up to a certain standard in these matters. Most modern types of electric lamps and incandescent gas mantles are brighter than 10 candles per sq. in., and one of the Regulations has the effect of requiring that they shall be equipped with reflectors of suitable depth or diffusing bowls. Such fittings, if of modern design, also ensure proper concentration over the working plane of all available light. Thus in many cases in which antiquated fittings are still in use, it will be found that the substitution of reflectors of modern type will result in illuminations of the intensity required without any increase in the power of lamps.

The Committee refer to the fact that on the outbreak of war natural light was, at many factories, completely eliminated by hastily improvized arrangements for complying with blackout restrictions, but find that in most factories provision has since been made for the admission of at any rate some natural light in the daytime. They report that it seems to be generally accepted that some method enabling natural light to be admitted during daytime is very desirable, and that a supply of natural light, even in small quantities, is an important factor in contributing to the cheerful appearance of a workroom. This object can be secured by the provision of shutters or blinds enabling part of the roof windows to be unobscured during the day. In many large factories exterior removable shutters forming part of the camouflage design when closed have been provided. Other factories have often made up quite effective interior shutters at small cost. The Committee think that this course might be extended with advantage but every care must, of course, be taken to ensure that the arrangement is light proof in compliance with the requirements of the Lighting (Restrictions) Order. They state that in the average roof-lighted factory, uncovering of the windows to the extent of 12% of the floor area so as to allow a reasonably uniform distribution of daylight is generally sufficient to enable work to be done without recourse to artificial light, but admission of natural light to even a smaller extent has proved to be of considerable benefit. Larger percentages would, of course, be necessary where window surfaces form part of a camouflage design or are otherwise partly obscured and the transmission of natural light through the glass is thereby reduced.

The Committee find it impossible to formulate any simple standard for side windows, since so much depends upon their height and outlook and upon the width of the room. They think, however, that in most rooms dependent solely on side-lighting, satisfactory conditions will obtain if the windows are provided with blinds or shutters allowing the full admission of daylight.

In regard to side windows, there has been an occasional tendency to remove the obstruction from the lower portion, leaving the upper part blackened. It may be desirable, therefore, to point out that from the point of view of general lighting the upper part is far the more effective in illuminating the interior of the room, and in the absence of any special reason to the contrary should preferably be left unobscured.

Many employers will feel that they need expert advice as to whether their lighting arrangements comply with the Regulations ; and such advice is especially to be desired where substantial alterations in the lighting arrangements are being made. Advice may also be obtained from the Gas Industry, from the local gas undertaking, or on application to the Secretary, Joint Gas Lighting Committee, The Institution of Gas Engineers, 1, Grosvenor Place, London, S.W. 1.

* Fifth Report of the Departmental Committee on Lighting in Factories published by H.M. Stationery Office, York House, Kingsway, London, W.C. 2. Price 3d.

† Copies may be purchased directly from His Majesty's Stationery Office, York House, Kingsway, W.C. 2; or through any bookseller.

MANCHESTER DISTRICT ASSOCIATION OF GAS ENGINEERS

An Ordinary General Meeting of the Manchester District Association of Gas Engineers was held at the Midland Hotel, Manchester, on Friday, Oct. 18. The attendance was fully up to pre-war standard. Mr. T. Reynolds (President) presided.

LUNCHEON

Prior to the meeting there was a Luncheon.

The PRESIDENT, in proposing the Toast of "Our Guests," said there was present the Senior Vice-President of The Institution of Gas Engineers, and while he included him as a guest, yet he was nevertheless a member of the Association. They were very proud to have both the President of The Institution of Gas Engineers (Mr. George Dixon) and the Senior Vice-President (Alderman Sir Frederick J. West) as members of the Association, and Sir Frederick might feel assured of the whole-hearted and enthusiastic support of the members of the Association during his year of office as President of the Institution.

As an Association they would offer their congratulations to Sir Frederick upon his appointment as Chairman of the North-Western Area Board, Ministry of Supply.

He was also pleased to welcome in their midst a number of students who had been successful in obtaining certificates in Gas Engineering subjects. It was hoped that the present meeting would give them the incentive further to pursue their studies, and ultimately become members of the Association, taking their place in furthering its objects.

Sir FREDERICK WEST, in responding to the toast, said the Association had paid him the great compliment of making him an Hon. Member as long ago as 1926. It was an honour he had always appreciated. Speaking as the Senior Vice-President of The Institution of Gas Engineers, he would say of that body that, despite the cancelling of its annual and autumn meetings, it was still continuing its work unobtrusively, but at the same time, he thought, efficiently. It was taking into consideration, and taking care of, those problems which the war had created; while it was also continuing its investigation into some of the scientific matters that it had in hand prior to the commencement of the war, and which, to a large extent, the war had further made necessary. At the last Council meeting, held in the home of the President, Mr. George Dixon, at Nottingham, the Agenda fully covered the activities of the Institution. It was reported that some of the principal activities of the Research Board covered complete gasification, the methane synthesis, the question of hydrogen balloons, fire bombs, smoke screens, while there was also a long discussion on the question of priority in regard to man-power. Consideration was also paid to the thickness of pipes for gas services, air-raid damage, and how to deal with it.

With regard to priority of man-power he was sure they would all feel the Industry had not been established in its proper position in respect to recognition by the different Ministries and the requirements of the present position generally. They were making a proposal to the Gas Federation with regard to the supply of material. The problem of man-power had now become a serious matter, and the Industry should be placed in a much more favourable position than it occupied at the present moment. This was a point of view which he felt sure all the members of the Association would heartily support, and it was hoped that as the result of the recommendations which had been made to the responsible authorities, an improvement would be effected.

At the same meeting it was decided also, as far as the activities of the present year were concerned, that the President should be asked to continue in office until the end of the Institution year. It might therefore be taken that Mr. George Dixon would continue as President of the Institution until June next, or thereabouts, and that the present Council would continue also in office. Taking into consideration the fact that the President and Vice-Presidents had now been in office for nearly a year and a half it would certainly seem desirable that they should continue in their present positions until the completion of the official year. He, himself, therefore, would not occupy the proud position of President of the Institution until June next, and if again he was invited to attend the autumn meeting of the Manchester District Association of Gas Engineers he hoped then to be able to attend as President of the Institution.

PRESENTATION OF CERTIFICATES

Sir Frederick was then invited to present the Certificates gained by successful students in respect of the various examinations for which they had entered. On behalf of the members of the Manchester District Association of Gas Engineers and The Institution of Gas Engineers, he congratulated them, and wished them every success in the careers they had chosen.

There were a number of points to which he wished to direct their attention. The first was that some of them had placed themselves in a position in which they might become members of the Institution, and he advised them to make application to do so in due course. To those who had not attempted to take the Diploma Course he would suggest they should endeavour to go a little further and secure the distinction of passing through it. He hoped that all of them would see to it that in their future careers they would do all they possibly could to uphold and maintain the dignity of the Gas Engineering profession in all their activities. He made this a definite point because the man-in-the-street did not recognize the gas engineering profession as being one which was as important as any of the other engineering professions. He was not prepared to state the reasons why such opinion was held, but there were certain contributing reasons for it, and it was a fact.

The Gas Engineering profession required its members to have a knowledge of Civil Engineering, Electrical Engineering, Hydraulic Engineering, and Chemical Engineering; and therefore a Gas Engineer must be as well-trained as the member of any other branch of the Engineering calling.

Having obtained the Diploma or having obtained the Higher Grade Certificate, it should not be decided by those who had been successful that they had finished their education. There was one important phase of education which never finished—namely, gaining a knowledge of human nature and of the human element in industry, whether it was in connexion with the workmen, or in connexion with the members of a Committee or of a Board. From his own point of view, and he had had a fairly long experience in business matters, an important point which was overlooked was correct contact with, and correct handling of, the human element—the men controlled by the Gas Engineer and the men who controlled him.

SUCCESSFUL CANDIDATES

Diploma in Gas Engineering (Manufacture).

A. Blenkiron,	Bradford,	1st Class.
J. Castle,	Brighouse,	" "
J. C. Hogg,	Stretford,	" "

Gas Engineering (Manufacture)—**Higher Grade.**

EXTERNAL CANDIDATES.

E. W. Burton,	Pontefract,	2nd Class.
G. Croad,	Hebden Bridge,	" "
G. D. Humphries,	Blackburn,	" "
W. R. Jessop,	Heywood,	" "

INTERNAL CANDIDATES.

C. Aveyard,	Morley,	2nd Class.
R. Bennett,	Rotherham,	" "
H. Brown,	Marple,	" "
N. Carter,	Rawmarsh,	" "
G. Fornachon,	Stockport,	" "
H. Foster,	Oldham,	" "
F. H. Maw,	Huddersfield,	" "
R. Santley,	Farnworth,	" "
J. B. McR. Smith,	Manchester,	" "
J. Styring,	Huddersfield,	" "
P. Tate,	Barnsley,	" "
C. B. Tooby,	Manchester,	" "
H. Ward,	Stalybridge,	" "

Gas Engineering (Supply)—**Higher Grade.**

EXTERNAL CANDIDATES.

R. D. Groom,	Southport,	2nd Class.
S. Heywood,	Liverpool,	" "
W. H. Tarn,	Liverpool,	" "

INTERNAL CANDIDATES.

J. E. Ashton,	Manchester,	1st Class.
H. Grimshaw,	Salford,	2nd Class.
R. W. Kirkbright,	Yeadon,	" "
J. Nangle,	Salford,	" "

Certificate in Gas Supply.

INTERNAL CANDIDATES.

M. F. Ford,	Liverpool,	2nd Class.
D. Foulis,	Liverpool,	" "

ORDINARY GENERAL MEETING

The Ordinary General Meeting of the Association was then held.

The members stood in silent appreciation of the memory of the late Mr. T. DUXBURY (Oldham), who had been a member of the Association since 1890, and was its President in 1908.

The following were then inducted as members of the Association: Mr. CHAS. COOPER, W. C. Holmes & Co. Ltd., Huddersfield, and Mr. F. G. SYMON, Assistant Engineer and Manager, Gas-Works, Stretford.

Owing to the circumstances brought about by the war it was recommended by the Committee that the President and other Officers of the Association be re-elected for the ensuing year.

Upon the motion of Mr. G. S. FRITH (Runcorn), seconded by Mr. F. G. SHAW (Buxton), it was unanimously resolved that the recommendation of the Committee be accepted.

TOWN GAS IN THE MANUFACTURE AND HEAT TREATMENT OF GLASS

The above-titled Paper was then read by Mr. R. L. GREAVES, of St. Helens. It was published in last week's "JOURNAL."

Discussion

The PRESIDENT thought that although Mr. Greaves had not said very much about the use of coke in glass works, there was doubtless a large and unexplored field for its use. It would appear to him that the Coke Associations could employ themselves very usefully in research work on how to apply coke in glass works. It would be ultimately to the benefit of the Gas Industry if they could dispense with all other fuels and concentrate on gas particularly, and, secondly, on coke.

Mr. GREAVES said that coke was a very suitable substitute for anthracite in producers, and much valuable research work had been done in this connexion by the London Counties Coke Association.

Mr. J. E. L. COOPER (Yeadon) said that with producer gas being costed at under 3d. per therm, and oil being taken as 2¼d. per therm, town gas was competitive at a higher figure because of its superiority. Even though it might not be cheap enough for a small glass works it might be cheap enough for a large one. Was there a point where town gas was competitive according to the size of the glass-making works? Could Mr. Greaves give any information as to what would be a competitive price for gas at the present time for pot furnaces in comparison with oil at special prices?

Mr. Greaves had paid a tribute to the Midlands Gas Centre for some work carried out at St. Helens. He, the speaker, appealed to all members of the Association to support the glass industry to their utmost.

Mr. GREAVES was of opinion it was possible to sell gas far too cheaply. Very big loads could be obtained at very much bigger figures than was sometimes thought. There were sizes of works in respect of which it would be far better to use town gas than producer gas. This was a point they were trying to make clear to some of the smaller works managements.

Mr. T. R. COOK (Blackpool) said that the paper revived memories of his own experience of 30 years ago in connexion with a bottle works in South Yorkshire. He had the pleasure of introducing coke-oven gas to the largest glass bottle manufacturing works in the country. Great difficulty was experienced in persuading the management to take gas at a price of 1¼d. per therm. At that time this was quite understandable because the price of coal was something in the region of 16s. a ton to the works. They took a very serious view of the capital expenditure involved, in the change-over to the use of coal gas from the producer gas. In addition, there was some difficulty with regard to the firing of the lehrs, and the management were afraid that the action of crude coke oven gas would affect the manufacture of bottles. There was, however, an increase from the first year from somewhere about 25,000 cu.ft., and at the end of the third year 250 million cu.ft. was being supplied per annum. He had always been interested in the mixture of the metals at the works; particularly in connexion with the various colours of the bottles. The works exported practically 70% of the medicine bottles all over the world. Could Mr. Greaves give some idea of the mixtures in plate glass and manufactured bottles? Also, had he had any experience in the fashioning of the necks of the bottles?

Mr. GREAVES said that while the chemical composition of plate-glass could not be exactly defined, it might be stated as sodium oxide, calcium oxide, and silica oxide. Bottle-glass had the same basis—Na_2O, CaO, SiO_2. Calcium oxide and silica oxide in bottle-glass were in proportions of five parts each and one of sodium oxide. From these bases any colour could be made. He did not think it was any secret to say that pure gold was the basis of a red colour. Neck work of bottles, edge work, and glazing work were dealt with in the Paper.

An interesting feature of glass-works was the production of tumblers by means of a revolving process. Bottle machines worked by compressed air produced bottles at the rate of 300 to 600 a minute on every machine. The holding capacity of a bottle could be tested by water to the degree of a cubic centimetre.

Mr. J. H. CLEGG (Marsden) said there were very few works where the manufacture of glass was carried out. He visited one in connexion with the production of glass bottles about ten years ago, and the amount of capital expenditure involved in a works of that nature was such as would frighten the ordinary small manufacturer. Nevertheless, his type of business was not to be despised. His first introduction to the use of gas for glass-bottle manufacture was in regard to the necking. The manufacturer found that gas was a very good substitute for oil. There was a high-pressure gas main close to the works. A supply was taken from this at a pressure of down to about 20 in. It was crude gas, and contained about 250 grains of H_2S, but this was not found to be any disadvantage. The success met with in necking the bottles inspired an attempt to convert the lehrs, which was found to be most simple. When the question of melting was considered, the price of gas had to be very considerably reduced before the manufacturer would consider using it. Coal was largely used, he might say almost entirely used, for the melting of glass. There were two tanks, one of 10 tons capacity and one of 20 tons capacity. After the conversion of the small one, the manufacturer was so pleased with its potentiality that he spent some money on his furnace with regard to a recuperator. This worked very successfully, and a temperature was reached of between 1500 and 1600° C. The price was about 2¼d. per therm. With regard to the heat pots which were used to raise the requisite temperature before the glass was put in, the gas had to be at a rather cheap price, though for the glory hole quite a good price could be obtained.

Vote of Thanks

Upon the motion of Mr. C. DIAMOND (Barrow-in-Furness), seconded by Mr. J. CORRIGAN (Brighouse), a hearty vote of thanks was accorded to Mr. Greaves for his Paper.

Mr. GREAVES briefly responded, and the proceedings concluded.

Results at Dundee

The quantity of gas sold by the Corporation of Dundee Gas Department during the twelve months ended May 15 (inclusive of that used on works) amounted to 1,552,836,075 cu.ft. When compared with the 1,759,979,750 cu.ft. sold in the preceding year, a decrease is shown of 207,143,675 cu.ft. Over the twelve months the gas unaccounted for has been reduced from 10.44% to 8.65%. Some decrease in the total number of consumers is accounted for entirely by the cessation of stair lighting. The figure at May 15 of 56,560 was made up of 29,291 prepayment meter users and 27,269 ordinary consumers. At the close of the financial year there were approximately 5,200 active hire-purchase accounts, as against 4,400 a year ago. The number of privately-owned cookers still continues to show a steady increase, thus lessening the demand on the Department for free-on-loan cookers. Of the total of 44,268 cookers, the present accounts show 15,406 to be privately owned. By last December circumstances had so affected the output of gas that a general increase of 8d. per 1,000 cu.ft. in the price was agreed to; but as the financial year progressed sales improved so considerably that, instead of closing with a deficit, there was a surplus of £13,535, which has been transferred to reserve. In preparing the estimates for the current year, it was found that a decrease of 4d. per 1,000 cu.ft. in price should be recommended, and this the Committee agreed to.

Fanfare—Autumn Issue

It is to be expected in these days that most publications should of necessity have to undergo some "reducing" treatment, but although the Autumn issue of *Fanfare* has fewer pages, the Editor is to be congratulated on the way in which she has managed to retain most of the usual features which have made the magazine so popular with members of the Women's Gas Council and housewives in general.

Besides the usual cookery articles, fashion notes, and knitting instructions, the present issue includes a new feature. In it begins a series of articles under the general title of "How it Works." These will describe the various appliances used by the housewife herself, and judging by the first article, which is on the subject of water heaters, the series should be of great interest, as well as a great help, to the housewife. Nothing can be more frightening to the female mind, we suppose, than a technical article, but the subject has been cunningly dealt with in that it opens with items of general interest, and then explains very simply the principles of the heater which the housewife should know in order to be able to manage the appliance properly. This series should be very helpful.

The news section of the present issue shows how the work of the Council is continuing in spite of all difficulties, and new and ambitious programmes are being arranged by Secretaries for the coming year.

Equipment . . .

LARGE SCALE EQUIPMENT FOR STAFF CANTEENS, ETC.

FROM areas served by Gas comes much of the considerable and—under present conditions—rapidly expanding need for kitchen and canteen equipment of all kinds.

The Radiation facilities for carrying out this class of work are widely known through the Trades Press, and enquiries for the introductory booklet already indicate the scope of this field.

Radiation have carried out a major proportion of this emergency equipment work for which they are able to cater completely, whatever size of installation may be in question.

Assistance from the trained Radiation staff is readily available in planning layouts and solving any particular problems that may arise.

The Radiation Large Scale Equipment catalogue is obtainable on request.

Radiation

THOUGHTS ON COKE

A Paper to the Institute of Fuel, Oct. 8.

By
W. L. BOON

General Manager of the London and Counties Coke Association.

COKE in the form and character of its present-day production and the diverse uses to which we now apply it might be termed a new fuel and a new industry which has grown and developed largely within the last 25 years. Yet history vaguely suggests that coke was used as an article of commerce some 2,000 years ago by the Chinese, although there is nothing to verify this, and we get to the Middle Ages before we can discern the beginning of deliberate coke manufacture when it is clearly ascertained that Julius, Duke of Brunswick, recommended the coking of coal in 1584. English records have it that coke was made in the Middle Ages principally by blacksmiths for the working of iron ; they reduced coal so that it was brought to a resemblance of charcoal, which was the fuel used for metallurgical work at that time. The scarcity of wood for charcoal-making and the increasing demand for iron stimulated investigations for its substitution by coke. We have quite considerable evidence of the necessity to make this substitution, and it is on record that the Scottish Parliament in 1609 passed an Ordinance restraining the use of wood for iron smelting because timber was so largely needed for other purposes, primarily for the building of ships.

In 1620 the Patents Office records that Patent No. 15 was granted to one Hugh Grundie and others to correct the malignant qualities of coal by the special means to purge from it the sulphur and other contagious mixtures therein so that the fuel would be serviceable for the making of iron. So that, in effect, it was the need for iron which initiated the making of coke and brought the science of its manufacture to its modern stage. Although about the same period we have a further powerful influence bringing coke most prominently into the public eye—namely, the brewing of beer. About 1640 coke was first applied to the drying of malt in Derby, and so important were the results that Derby malt and Derby beer became famous all over the country. Malt from Derby was regularly sent to London despite the difficulties of transport, and later records tell us that 200 loads of Derby malt were also taken to Lancashire and Cheshire each week. The fame of Derby malt led to the manufacture of " hearth " coke in other areas, and in 1663 Sir Robert Murray, describing this making of malt in Scotland, said : " They have a way of charring coal in all particulars the same as they do wood, whence the coal is freed from those noxious steams that would otherwise give the malt an ill odour."

The method of producing the coke in those days was probably developed by the charcoal burner, who set large coal in heaps and banked it with coal dust, a crude method of coke making which was continued probably for over 200 years, and Dud-Dudley, a man well known among the iron workers of those days, was popularly accredited with the greatest success in substituting coke for charcoal in iron smelting, although the credit for the successful use of coke for this purpose probably and more properly belongs to Abraham Darby, of Shropshire, whose successful application dates from about 1735.

First Blast Furnaces

It was not until 1750, however, that the first coke blast furnace was built in Cumberland by John Cookson, and by degrees others followed Cookson's lead, and, due to a rapidly increasing demand for iron, it is evident that the success of the coke blast furnace was fully established by 1790, by which time there were 81 in operation throughout the country.

What great changes have taken place in the coke oven industry and the manufacture of coke since those days ; yet, as I have already stated, the greatest development lies entirely within the last 25 years. Even 25 years ago mechanical handling of the coke after discharge was almost unknown, and it was lifted by hand into railway wagons. The construction of coke ovens at that time made it impossible to heat them uniformly, so that even 25 years ago the coke manufactured was uncertain in its composition and lacked uniformity of size and structure. The great mechanized plants with which we are familiar to-day had not begun to be built in this country until after the last war, so that the intervening years have seen the size of the by-product oven grow to its present dimensions. They have seen, too, mechanization carried to such a degree that the number of men required to operate a battery has been reduced per ton of coke to a very small fraction of the number required in 1914. The heating of coke ovens has been improved out of all recognition, and scientific instruments have been applied to control its manufacture which 25 years ago had not even been envisaged.

There was then little realization of the importance of the character of the coal that was to be carbonized, and it was the practice to put into the coke oven whatever rubbish the colliery had no other use for. To-day we recognize that the quality of coal is of fundamental importance, and that the characteristics of the coke and its value in use are profoundly affected by careful selection of the coals to be carbonized.

We have not yet progressed very far in the science of blending coals, though blending is becoming common practice ; not only of blending of different coals, but of coal with coke breeze ; and more attention is being given to the preparation of these mixtures before carbonizing so that coke of the correct quality and structure may be produced for the purpose for which it is to be used. There is a wide difference, for example, between the characteristics of coke required for the blast furnace and cokes produced specifically for domestic use.

In the old days coke was produced, and one used it as far as one was able to do so ; to-day it is manufactured for the purposes for which we specifically require it. There is no comparison therefore between the so-called cokes of 25 years ago and the exact fuel produced to specification which yet (and perhaps with some disadvantage) retains the name of *coke*. These remarks are true whether the coke comes from by-product ovens or from gas-making retorts ; and while great strides have been made in the improvement of coke quality, there is every indication that improvements in this direction will continue when peace-time conditions of coke production allow progress to be resumed.

In the last decade we have seen many significant changes in the coke-producing industries, one of the most outstanding perhaps being the convergence of development of the coke oven industry and the Gas Industry. These two industries, producing about equal quantities of the total coke made, and now carbonizing in the aggregate nearly 40 million tons of coal per annum, have come together in two major directions—first in the marketing and utilization of their coke products, and secondly in the purchase and utilization of coke oven gas. Also the two industries have arranged common action in the marketing of benzole, sulphate of ammonia, and tar, so that there is a close business alliance which did not exist, and had indeed no reason to exist, before the last war.

We have seen a further important movement in the coking industry which has a significant bearing on the production of coke for the general market. During the last ten years there has been a great reconstruction of the British iron and steel industry in which works have erected their own coke ovens and are utilizing or are preparing to utilize blast-furnace gas, coke oven gas, and even coke within their own works. The effect of this is to make the whole of the steel industry self-contained and independent of its requirements of blast-furnace coke which in earlier years it had purchased from the colliery coke ovens. This development has already assumed large proportions, and the day is probably not far distant when the great bulk of the coke requirements of the steel industry will be satisfied from its own coking plants. This development must be recognized as a process of rational integration providing for commercial and technical stability and for greater efficiency in steel production, but it will have the effect of directing colliery oven coke increasingly to other markets, to be used for purposes other than the manufacture of iron and steel. The purposes for which it may then be used embrace almost every type of heat application for which solid fuel can be utilized, so that coke production from the colliery coke ovens must develop exactly in the same markets and be used for the same general purposes as gas coke. This position is being wisely determined by the two industries who have recently set up joint associations, agreeing on marketing methods and co-ordinating development, so that instead of the old evils of competition between the two industries we can envisage progress on co-operative lines and under sane economic conditions.

It can be said, therefore, that the trend of development which has now been instituted by the coking industries appears to be on sound foundations, and if the progress which this unity of purpose promises is fulfilled, both commercially and technically, there would be no reason to doubt its future prosperity.

Coke Quality

There is no room, however, for complacency with regard to the quality of coke which the two industries are producing, and as market development must be progressive, then coke quality must be kept in step with it.

If one may forecast what the future holds in this connexion, I would say that the quality of coal used for coke making will receive first consideration whether it be for the production of blast-furnace coke or for coke made by the Gas Industry. Particularly for home markets, higher-grade cokes must be produced and low-ash coals will become essential for this purpose. We see already clear indication of this demand in the coal-cleaning policy which is being followed by coal producers, and we can envisage still further progress towards improved standards of coal cleaning. We shall require coal into coke ovens or into gas retorts as free from inorganic material as the modern science of coal preparation and treatment can devise.

The art of coal blending and/or of coal and coke admixture before carbonization has obtained most important and encouraging results,

and there should be no question that research will continue in this direction. We may envisage, too, the treatment of coke after carbonization for specific purposes. The domestic market in particular is insistent in its demand for improved quality in fuel, and, to keep pace with its demands, we must contemplate many changes in the future and the adoption of a progressive policy in interpreting and perhaps keeping ahead of the consumers' requirements. For example, I think we shall have to contemplate the dustproofing of coke.

Dustproofing of Coke

Because of improved methods of production for the market, coke of low moisture content, delivered to the consumer, frequently creates dust during delivery and in subsequent handling to such an extent as to become a nuisance.

It has been recognized by some American coal and coke producers that to dustproof their fuel was a selling point, which has since been found by consumers (householders particularly) to be such a real one. It is now estimated that about ten million tons of dustproofed domestic solid fuel (coal and coke) are delivered annually in the U.S.A.

The problem of dustproofing coke is quite different from that of coal and has been independently investigated. Its importance has been recognized in this country, and one large gas undertaking, immediately prior to the outbreak of war, was about to investigate research thereon on a large scale.

It is considered very necessary that when normal conditions return such investigation should proceed, especially in view of the widespread desire of producers to improve the quality of coke and eliminate whatever disadvantages it might have had. Coke with the attributes of high calorific value, low ash and moisture content, grading, ignitability, &c., is surely yet a better fuel if the dust nuisance is mitigated if not entirely eliminated.

Many claims have been put forward on behalf of dustproofed solid fuel. The more reasonable of these are as follows :

1. Up to 75% of the dust usually present may be eliminated. This has the following advantages :
   (*a*) Cleanliness of handling at all points.
   (*b*) Reduction of the danger of spontaneous combustion.
2. Freezing during transport is minimized.
3. On account of the lubricating effect of the treatment—
   (*a*) Degradation during transport may be reduced.
   (*b*) Uneven motion in bins, hoppers, &c., is probably reduced.
4. Corrosion of bins, hoppers, &c., due to wet fuel may be reduced.
5. Undocumented claims have been made that the amount of clinker from treated solid fuels is reduced and that clinker when formed is porous.

The duration effect of dustproofing of coke has not yet been investigated, although coal figures are available from U.S.A. It has been shown that proofing remains effective for three months, coal proofed to 20 grammes of dust per ton containing 35 to 40 grammes of dust per ton at the end of that period. The increase took place largely during the first month.

Based on pre-war prices the cost of dustproofing has been estimated to be from 4½d. to 1s. 2d. per ton of coke, according to the proofing material used.

American practice has been largely confined to the use of calcium chloride, and it is claimed that treatment by this material gives a greater permanency and it is reasonably proof against freezing ; it does not increase the fire hazard and it makes no detrimental alteration in the burning of the fuel, neither does it have any obnoxious odour.

The alleged fault, however, of the calcium chloride treatment is the possibility of corrosion of steel surfaces with which it may come in contact, but this claim is hardly borne out by the experience of those companies who have used calcium chloride dustproofing treatment for some time.

Activation of Coke

For certain domestic purposes, particularly for the ordinary open fire, more reactive coke is necessary than is normally produced by the by-product oven or by ordinary gas retorts.

Coke, being a substance consisting of carbon, can be increased in reactivity by mixing it with sodium carbonate, the result being, in one particular case chosen by way of example, that gas coke can be made capable of burning in an ordinary stool grate, whereas previously a special coke grate was necessary for its combustion. It has been found that this increase of reactivity may be produced either by treating coke with sodium carbonate after carbonizing or by treating the coal with alkali before carbonizing. The fact that activation can take place after the coke itself is treated disposes of the belief that was once common that the increase of reactivity is due entirely to an increase in the volatile content of the coke.

A great deal of practical work on the activation of coke has already been done, and many problems, both commercial and technical, have been solved, but it is premature to form conclusions as to the future practical effect and scope of this process on the domestic coke market.

Sizes of Coke

Perhaps the most important question of all with regard to the efficient utilization of coke is the question of size, and a great deal of work has been done in recent years in the testing of appliances in order to determine the size of fuel which would give the most efficient results in operation. In the South of England we have perhaps done more work with regard to co-ordination and standardization of sizes than in any other section of the country. We have now operated for some years on the following standard sizes of coke which have covered all market requirements.

TABLE I.

STANDARD SIZES OF GAS COKE USED IN THE SOUTH OF ENGLAND.

Name.	Size No.	Screened within the following limits.
Large or unbroken coke	1	Over a 1¾″ square mesh, not sized to any limit.
2″ × 3″ coke ..	1A	Within the limits of 1¾″–3½″ square mesh.
Broken coke ..	2	Within the limits of 1″–2″ square mesh.
Coke boiler nuts ..	3	Within the limits of ½″–1¼″ square mesh.
Forge coke beans	4	Within the limits of ⅜″–¾″ square mesh.
Automatic stoker coke (unwashed)	5	Within the limits of ¼″–½″ square mesh.

Some 18 months ago a market survey was instituted to ascertain whether the conditions of trade had in any way altered or whether they had shown that these sizes should be either augmented or in any way changed. The result of this survey was to confirm that the standards were adequate and that they should be adhered to.

With regard to the production of coke from by-product ovens which is destined for the general markets we find that there are yet over 40 different sizes, and recently a Technical Committee of classification has taken steps to reduce these to the same standard sizes which have been in operation for gas-coke markets in the South of England.

Table II will indicate the sizes which have been in operation, and how they are being related to the standards in Table I above.

TABLE II.

NORMAL TRADE SIZES OF FURNACE COKE SHOWING GAS COKE SIZE GROUP IN WHICH THEY HAVE BEEN PLACED.

Gas Coke Size No.	Furnace Coke screened within the following limits.
1	Over 3½″, not sized to any upper limit. Over 3″, not sized to any upper limit. Over 2¾″, not sized to any upper limit. Over 2½″, not sized to any upper limit. Over 2″, not sized to any upper limit. Over 1½″, not sized to any upper limit. 2¼″ × 4″.
1A	2″ × 3½″ ; 2″ × 3″ ; 2″ × 2½″ 1¾″ × 3½″ ; 1¾″ × 2½″ 1½″ × 3″ ; 1½″ × 2½″ 1¼″ × 3″ ; 1¼″ × 2¾″ ; 1¼″ × 2½″
2	1½″ × 2″ ; 1½″ × ¾″ 1⅜″ × 1⅞″ ; 1⅜″ × 1¼″ 1¼″ × 2″ ; 1¼″ × 1¾″ ; 1¼″ × 1½″ 1″ × 2″ ; 1″ × 1½″ ; 1″ × 1⅜″ ⅞″ × 2″ ; ⅞″ × 1½″ ¾″ × 1¾″ ; ¾″ × 1½″ ⅝″ × 1½″
3	1″ × 1¼″ ⅞″ × 1⅛″ ⅝″ × 1¼″ ; ¾″ × 1″ ⅝″ × 1″ ; ⅝″ × ⅞″ ½″ × 1″ ; ½″ × ⅞″
4	½″ × ¾″ ; ½″ × ⅝″ ⅜″ × ¾″ ¼″ × ½″ 3/16″ × ½″

A change of sizes in any immediately wholesale way is not, however, practicable, except by a process of elimination, although it is indicative of the co-ordination which exists in the two industries when a change of such importance can be agreed and determined in what after all is a comparatively short space of time in relation to the period since the general coke markets have been catered for.

Ancient terms in regard to the designations of coke sizes, such as apples, pears, chestnuts, peas, and the other peculiar names which have persisted from old custom, are being eliminated under the headings in Table I. In effect, therefore, as opposed to something like 40 different sizes which are confusing and unnecessary to the market and which in many cases must be inefficient in operation, the production of coke will be resolved progressively into five essential categories. The effect of this will be beneficial to every section of the trade, and not least it will improve efficiency in utilization which is looming as the main plank in the policy of the industry. The effect of size has been studied for every kind of coke-burning appliance in common use, and size determinations have been arrived at, which are largely resolved by the two considerations of ignition and radiation. Generally it may be stated that with increasing proportions of the smaller sizes, ignition is improved and radiation decreased due to the closer packing of the

fuel and the restriction of air passage through the mass. As an example to illustrate these effects, we might take the domestic open fire contructed to burn gas coke, and in Tables III and IV are a series of tests which clearly confirm the suitability of coke for this purpose, sized between 1 in. and 2 in.

TABLE III.

THE EFFECT OF SIZE ON THE LIGHTING OF COKE.

Mixture.	Grading Analysis of Coke (B.S. Screens).				Lighting time.	Radiation after 1 hour.
	½"–1" %	1"–1½" %	1½"–2" %	2"–2½" %	min.	Kilocal./ sq. ft./hour.
1	0	0	100	0	30	26.5
2	0	25	75	0	25	22.5
3	0	62	38	0	20	17.0
4	0	75	25	0	20	17.0
5	0	100	0	0	15	21.5
6	0	20	60	20	30	25.0
7	20	60	20	0	35	13–17

TABLE IV.

Grade of coke used.	Total coke consumed. lb. oz.	Average weight of coke consumed per hour. lb.	Radiation Kilocal./sq. ft./hr.	
			Average.	Average per lb. coke.
100% 2"–1"	26 1	3.9	38.8	10.04
80% 2"–1" } 20% 3"–2" }	27 7	4.2	42.2	10.02
80% 2"–1" } 20% 1"–½" }	26 6	3.7	32.6	8.86
90% 2"–1" } 10% ½"–0" }	24 6	3.4	31.0	9.2

For the purposes of this Paper, I feel that I have sufficiently outlined the position and to some extent the post-war outlook as regards the production and quality of coke, and that I might now pass to matters of perhaps more common interest to members. The question of coke quality is to some degree important to heating engineers, and they will have been interested to learn that the industry is following an actively progressive policy in this direction. I might add one further point, and that is the uniformity of specification as it affects the uniformity of operation. In other words, we are conscious of the importance of getting the same class of coke to a consumer which has been proved most satisfactory for his purpose and in seeing that he continues to obtain that class of coke without variation in its characteristics. The industry has appreciated that its standards must be more exacting, and it is setting itself out to achieve that. I think we should all agree that coke has enormously improved in value during the last decade, and the machinery which has been devised for still greater progress through the work of its associations provides for a common pooling of research and experience which should ensure both technical and commercial advantage to the industry and those it serves.

Coke Associations and their Functions

The formation of coke associations within the structure of the two coke-producing industries represents a most important step forward not only as a rational economic policy, but in so far as it guarantees the objective to obtain a more effective utilization of their products. Through these bodies and their interpretation of this objective, there is clearly a common platform which meets the heating engineer, the appliance manufacturer and the consumer of fuel in their respective fields. If the coke producers are fully to implement their policy to obtain greater efficiency in utilization for their products, then they must essentially be closely concerned with every form of use to which their commodity is put and every appliance for, or in, which it is used. If the industry is setting out to ensure that the consumer obtains the utmost value from the fuel it supplies to him, then it must be certain that he has the means to achieve it and that the methods and appliances he employs are practical and efficient.

It would be an economic blunder to expend money in the improvement of coke quality and to have that value wasted by inefficiency of application or the shortcomings of ill-designed or inadequate appliances. In the past the producers of coke have been largely satisfied to manufacture their commodity and to leave it to others to take it and utilize it as best they can. They were not interested whether it might be well or ill used, if indeed they possessed the knowledge to permit of any judgment. In this new policy the industry is not setting itself against the interests of heating engineers or appliance makers, neither it is usurping any of the functions of merchants or other persons who have a legitimate place in the trade. Its purpose is to seek alliance with those bodies or persons so that effort to the common good is strengthened. The functions of coke associations are generous in their scope and envisage an active policy of development in a wide and varied way ; for example, in the investigation and opening up of new markets for coke absorption to act as a negotiating body which maintains and seeks contacts with other industrial bodies whose interests are allied to it. It aims to provide some educational channel for the employees of its members whereby the technique of coke utilization and selling is improved. It provides for co-ordinated publicity and propaganda as well as technical and commercial information to its members. It aims to provide a direct technical service to consumers, and within its own sphere deals with production and distribution of its commodity as well as with questions arising in regard to market surveys and quality considerations.

It might be of interest to examine how some of these functions have been actually carried out, although it would be misleading to suppose that the whole of the industry is as yet adequately organized to fulfil this ambitious programme in its entirety.

The London and Counties Coke Association was one of the first organizations of this character to be formed in the industry, so that we might examine the policy which they have followed as some criterion of the work which might be undertaken by other associations which are already in being or which might be formed in the future.

Approved List of Coke-burning Appliances.

Let us first examine the position which the London Association has taken with regard to coke-burning appliances and its relation to the manufacturers of such appliances. During a series of years, and through its auspices, tests have been carried out on practically every type and character of appliance which is commonly used for coke burning, and it was quickly discovered that there were serious shortcomings in certain appliances to such a degree as to render them largely ineffective for their purpose. It is obvious that the interests of the associations would best be served by having the largest number of appliances available to the markets, so that there would be no point in attempting to suppress the production or sale of an appliance unless it were unfitted for the purpose for which it was sold. Having a wide experience of coke burning in all its phases from which to draw its conclusions, the technical committees of the association were able to assess values and to lay down specifications by which the performance of appliances could be accurately judged. These specifications were formulated in alliance with the trades concerned, so that ultimately an approved standard for coke-burning appliances of every kind was produced. The experience and knowledge which was gained by the association in the design or performance of either existing or new appliances has always been passed on to manufacturers, as the association itself has no interest either in the manufacture or sale of any appliance other than through the legitimate channels of the trade.

With these specifications and the test data which had been accumulated as a basis, the compilation of an approved list of appliances was commenced. It was a monumental work both as regards time and cost, but it was considered to be of fundamental importance because it had two objects; first to ensure an efficient standard of coke utilization, and secondly to remove the old bone of contention that the appliance was to blame for bad performance, and not the fuel it used. An approved appliance gives us therefore a clear issue on the question of fuel quality ; if its performance is bad, the fuel is bad.

Last, but not least, it gives certain protection to the coke consumer who, purchasing an appliance, cannot be expected to distinguish between those which are efficient and those which are not.

I think it will be agreed that the issue and compilation of such a list epitomizes a co-ordination of technical work and commercial prudence of which we have as yet only rare examples in the solid-fuel industry. As a result of this list no appliance is recommended or purchased through the coke or gas industries unless it has been tested and approved, so that the sales of an appliance are either assisted because it is on the list or resisted if it is not.

To build and fortify our markets after this war is over we shall need to employ every means at our command, and there can be no greater contribution to this end than the effective co-operation of the technician in the commercial field. There has always been a cleavage between the technical and the commercial spheres of the solid-fuel industry ; such separation has not been conducive to its good, and the industry cannot afford to condone it in the future.

Central Heating.

It can be claimed that coke associations have materially contributed to the popularizing of central heating and that they will bring greater strength to this objective in the future. This has been done largely by publicity and propaganda, although the technical officers of these bodies, having direct contact with consumers, bring personal effort to bear and are in effect selling the principle. Coke is the fuel most commonly used for central heating, so that it constitutes an important market which the industry is concerned to maintain and develop. It does this actively and by direct technical service in several directions, perhaps the most important being the advisory service to the consumer whose plants are visited by technical men, and the advice given as to their operation so that efficient utilization is obtained. This service, quite free of charge to the coke consumer, has a much wider scope than purely advisory, as it extends to the testing of plants, the adjustment of thermostatic control and damper equipment, and generally to practical assistance in the solution of any troubles which might arise. It would be instructive to examine briefly the basis of this service and the character of the information which is given.

Combustion Control.

The majority of central heating boilers in this country are of the cast-iron sectional hand-fired type, and plant operators are advised on the adjustment of the primary air, chimney and check-draught dampers and are impressed with the need for cleaning frequently the boiler flues and the water surfaces in the fire backs.

Chimney-Draught Control.

The boiler attendant is asked to remember two important points :

1. The boiler should always be worked with the minimum possible chimney draught.

2. The more constant the chimney draught is maintained the easier the control of combustion and that any air which enters the boiler, except through the dampers provided for this purpose, will cause waste.

It is also advised that all flue doors should fit as closely as possible to their frames, and that there should not be any gap more than ten-thousandths of an inch at these points, and in cases where such doors or frames are bad fitting, they are either advised to order new doors or frames from the makers, or alternatively to have them refaced so that air leakage on the plant is reduced to the minimum.

Flue and Check-Draught Dampers.

Boiler attendants are perhaps notorious for neglecting the proper operation of dampers, and particularly do they neglect to use the check-draught damper, so the importance and functions of these fitments are carefully explained, particularly in cases where chimney draught is excessive.

The importance of maintaining a constant chimney draught independent of climatic conditions of wind or air temperature has become a matter to which our service engineers now give particular attention. They maintain that probably the greatest single cause of inefficiency is irregular and excessive draught, and they are consequently interested in and are advising the greater use of draught stabilizers as a practical and necessary part of every important central-heating installation. Tests on a number of different boilers have shown that the chimney draught required to give the full rated output of various central-heating boilers varies between 0.1 in. and 0.18 in. W.G. The draught required depends chiefly upon the fuel-bed depth, fuel size, and design of the boiler flueways ; chimney draught does *not* depend upon boiler output, as will be seen from the following Table V, and conversely the rated output of a boiler does not depend upon chimney draught in excess of that tabulated below, the " rated output " being on the accepted basis of 4400 B.Th.U. per sq. ft. of heating surface per hour.

CHIMNEY DRAUGHT TO GIVE BOILER RATED HEAT OUTPUT.

Boiler.	Heat Output B.Th.U./hour.	Chimney Draught required inches W.G.
A	73,000	0.12
B	189,000	0.10
C	282,000	0.14
D	364,000	0.18
E	511,000	0.18
F	997,000	0.13
G	1,227,000	0.09

Most chimneys will give a draught in excess of the above figures. Thus, take for example a 500,000 B.Th.U./hr. boiler operating at its rated output and connected to a 9-in. square brick chimney. If there is one right-angled bend between the boiler and the chimney, the draught will be approximately as follows :

CHIMNEY DRAUGHT WHEN 500,000 B.TH.U./HR. BOILER IS OPERATING AT RATED HEAT OUTPUT.

Air temperature 40° F., one right-angled bend.

Flue-gas temperature 400° F. average.

Height of chimney.	Available draught at boiler outlet in W G.
60 ft.	0.32
50 ft.	0.26
40 ft.	0.20

Thus, for this particular boiler which requires a chimney draught of 0.18 in. wherever the chimney is in excess of 38.0 ft. high, it will be necessary to make use of the boiler chimney damper and/or the check draught in order to reduce the effective pull on the boiler to the required level of 0.18 in. water gauge.

Inleakage of Air above Fuel Level.

Most central-heating boilers, correctly fired, will give an average of 11.0% CO_2 in the flue gases. In the case of large installations an analysis of the flue gases becomes increasingly important. If the CO_2 percentage is lower than 11.0% the boiler is not operating efficiently and steps should be taken to ensure that, firstly, the setting of the secondary air damper is correct, and secondly, that there is no leakage through badly-fitting fire doors, cleaning doors, or flue doors. The fit of all these doors should be examined, and, if necessary, improved during the summer overhaul. A clearance of less than ten-thousandths of an inch is advisable. It will be found that using coke, anthracite or Welsh smokeless coals the boiler can be operated with the secondary air damper almost shut.

Inleakage of Air at Boiler Foundations.

Very few central-heating boilers are of the closed-ashpit type, and air inleakage can occur between the legs of the boiler sections and the foundations. It is generally advocated that the legs should be " grouted " into the foundations.

The ash from the ashpit will in some cases form an effective seal ; but it is preferable where there is no cement, or where the cement has become cracked, to cover the legs on the outside, or in the ashpit to a depth of about ½ in. For boilers fitted with a sheet-metal case it is cheaper to cement the legs on the ashpit side than to take the casing off.

Working Instructions.

These are usually provided by most boiler makers, and if they are observed they form an excellent guide to the attendant for the care, maintenance and operation of his boiler. Such instructions do not, however, contemplate the operation of the central-heating plant as a whole, but only the component parts of it. If the plant, as a whole, is to be efficiently operated then these instructions to the attendant should be equally comprehensive.

It would be clearly impracticable for such instructions to be provided by any maker of component appliances, as they could only be formulated after a study of the operation and requirements of the plant as a whole, and each installation would require its own special instructions to provide for its own peculiar needs.

After a study of a specific central-heating plant, working instructions are formulated for the benefit of the boiler attendant which he can quite simply follow and which will be effective in running the plant efficiently. Accurate setting of dampers requires practice, careful observation of cause and effect, anticipation of weather conditions, and a routine which ensures that the fire in the boilers is as nearly as possible in the same condition each morning. One of the first requirements is to determine the boiler-water temperature, in relation to the outside temperature for the required building temperature. Table VI is a guide given to the boiler attendant for the setting of his dampers, but more accurate figures are often determined in the case of each separate installation. It will be appreciated that the construction of buildings, the radiation surfaces provided and a number of other factors can vary very largely the temperatures which have to be maintained in the boiler. The values in the following Table refer to a room temperature of 60° F. to 65° F. :

	° F.					
Morning Outside Shade Temperature	55	50	45	40	35	30
Approx. Boiler Flow Water Temperature	105	120	135	150	165	180

The general procedure should be to take the atmospheric shade temperature each morning and to adjust the dampers accordingly. Where the boiler attendant is keen he will be able to amplify the above Table so that adjustments are made for abnormal wind conditions which will cause a more rapid cooling of the building, or for sunshine which will decrease the required heat input to the building for a given shade temperature. Intelligent anticipation of the weather is a big factor in maintaining comfortable conditions in the building, and at the same time avoiding waste by overheating.

Examination of monthly shade-temperature figures confirms that December, January, and February are the coldest months. The following Table of shade temperatures (averaged over 14 years) can be taken as representative of conditions in the South of England :

—	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Average Atmospheric Shade Temperature ° F.	60.0	52.2	45.6	41.4	42.4	41.2	45.3	48.7	55.7
Maximum Shade Temperature ° F.	65.1	53.8	48.2	48.9	45.5	46.0	50.9	51.8	57.9
Minimum Shade Temperature ° F.	54.5	48.6	41.2	36.5	35.9	33.1	41.0	45.8	53.2

When the air temperatures are high during September, October, November, March, April, and May there is a definite advantage to be gained by reducing the chimney draught below that required to give the rated output of the boiler. With the lower chimney draught any inleakage of air at flue doors, &c., will be reduced to a minimum, and the loss of boiler efficiency by the cooling of the flue gases avoided. A higher value of chimney draught can be used when this is required during December, January, and February. It will be realized from the above notes on damper setting that a chimney-draught stabilizer is essential if the best results are to be obtained, and that a fine-reading draught gauge will be an advantage for every central heating plant.

Apart altogether from the operation of the plant, the boiler attendant is advised on the sources of heat waste in buildings which take place by excessive ventilation through the unnecessary openings of windows and doors. In short, the advisory programme can be resolved into three cardinal points, namely :

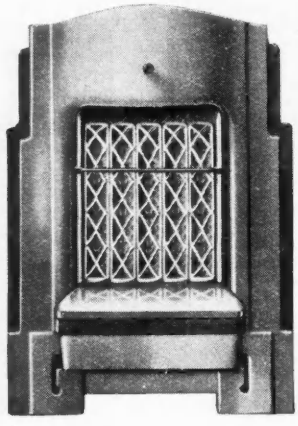
1. That the boiler and the combustion control dampers are in good order.
2. That the boiler is operated efficiently.
3. That no heat is wasted in the building.

(To be concluded in a forthcoming issue)

Two Portable Aids to "Emergency" Gas Heating

The NEWSCREEN Fire

An efficient gas-fire of pressed-steel construction, lightweight, and easily carried from room to room and fixed to "plug-in" points. Its extreme lightness has been achieved without lessening its qualities as a thoroughly dependable gas-fire of strong build, fulfilling the requirements of the "Lancet" test. The No. 3205 size can be supplied with a lighter fitted at a convenient point near the top of the frame (see illustration).



Each NEWSCREEN has a loose panel which covers up and protects the radiants when the fire is not in use.

When the fire is in use the panel can be attached to the back of the frame.

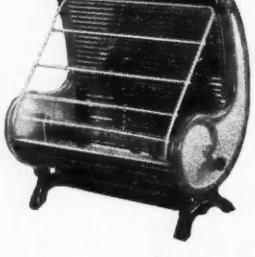
A carrying handle is provided at the back above the flue opening.

The NEWSCREEN can be had in a variety of attractive duotone colour finishes.

The GLOWMAIN Heater

A convenient and effective little "flueless" heater, with a very low gas consumption of about 12.5 cubic feet per hour.

Its cast-iron sides are covered internally by a separate chromium-plated lining which keeps the outside from becoming overheated. There is also a separate back with ventilating channels between the exterior back and the reflector.



Direct radiant heat cannot reach the floor. The cast-iron feet ensure rigidity.

A dress-guard is provided and this is sprung into position top and bottom, and can thus be easily removed to allow the reflector to be dusted. The burner and the heating element are also easily removed. A lighter is fitted at the side, as shown.

The GLOWMAIN is obtainable in a choice of colour finishes.

Stock these economical aids to "Emergency" Gas Heating

MAIN

Literature for your Showrooms will be sent on request

R. & A. MAIN LIMITED, LONDON AND FALKIRK

Gas Products Prices

The London Market

Oct. 28

Prices of Tar Products in the London market remain unchanged at about the following levels: Creosote is about 4⅜d. to 5d. per gallon, refined tar 3⅜d. to 4d., the price of pure toluene under the Ministry of Supply Toluene No. 2 Order is 2s. 5d. per gallon, pure benzole 1s. 10d., 95/160 solvent naphtha 1s. 11d. to 2s. 0d., and 90/160 pyridine about 17s. 6d. all per gallon naked, refined naphthalene crystals £23 per ton in bags, all *ex* Makers' Works.

The Provinces

Oct. 28

The average prices of gas-works products during the week were: Pitch and Crude Tar.* Toluole, naked, North, 1s. 9½d. (Controlled by the Ministry of Supply Order No. 1, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North 9d. to 9½d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 9d. Heavy naphtha, North, 1s. 4½d. to 1s. 5½d. Creosote, *ex* works, in bulk, North liquid and salty, 4½d. to 4¾d.; Scotland, 4¼d. to 4¾d.; low gravity, 4½d. to 4¾d. Fuel Grade, 4d. to 4¼d. Carbolic acid, 60's, 3s. 6d. to 3s. 7½d. Naphthalene, £15 to £20. Salts, 75s. to 85s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal. Heavy oil: Unfiltered anthracene oil, (min. gr. 1,080), 5¼d. to 5½d.; filtered heavy oil (min. gr. 1,080), 5¾d. to 6d.; heavy anthracene oil gr. less than 1,080, 6d. to 6¼d.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note in our issue of Sept. 4, p. 404.

Tar Products in Scotland

GLASGOW, Oct. 26.

Throughput is well maintained with prices of all products steady.

Refined tar.—Makers are maintaining prices in the home market at 4¼d. to 4½d. per gallon, while for export supplies are available at 3½d. per gallon, both f.o.r. naked.

Creosote oil.—An improved demand has been noticeable during the last few weeks and prices are as under. Specification oil, 5d. to 5¼d. per gallon; low gravity, 6d. to 6½d. per gallon; neutral oil, 5¾d. to 6d. per gallon; all *ex* Works in bulk.

Cresylic acid.—Export enquiries are more numerous, but prices show no alteration as under; Pale, 99/100%, 2s. 2d. to 2s. 4d. per gallon; pale, 97/99%, 1s. 11d. to 2s. per gallon; dark, 97/99%, 1s. 7d. to 1s. 9d. per gallon; all *ex* Works in buyers' packages.

Crude naphtha continues to change hands at 6½d. to 7½d. per gallon *ex* Works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 8½d to 1s. 9d. per gallon, and 90/190 Heavynaphtha. is 1s. 4½d. to 1s. 5½d. per gallon.

Motor benzole is 1s. 9d. to 1s. 9½d. per gallon.

Pyridine.—90/160 grade is 17s. to 18s. per gallon, and 90/140 grade is 19s. to 20s. per gallon.

Associated Gas and Water Undertakings, Ltd.

The Directors of Associated Gas and Water Undertakings, Ltd., have declared an interim dividend of 2½% actual, less tax, on the ordinary shares, on account of the year ending March 31, 1941, payable Nov. 30, 1940 (same).

THIS WEEK'S ADVERTISERS

	PAGE
Aerospray Manufacturing Co., Ltd.	181
Alder and Mackay, Ltd.	208
Ashmore, Benson, Pease, & Co., Ltd.	179
Bale & Church, Ltd.	210
Blakeley, Firth, Sons, & Co., Ltd.	210
Bray, George, & Co., Ltd.	178
British Aero Components, Ltd.	185
British Fitting Co. (Hendon), Ltd.	209
Brotherhood, Peter, Ltd.	187
Clayton, Son, & Co., Ltd.	182
Cowan, W. & B.	Cover III
Dempster, R. & J., Ltd.	177
Dempster, Robert, & Sons, Ltd.	210, 194
Diaphragm & General Leather Co., Ltd. ...	212
Donkin Co., Ltd. (The Bryan)	Cover II
Ellison Insulations, Ltd.	210
Gas Meter Co., Ltd.	Cover IV
Gas Purification and Chemical Co., Ltd. ...	210
Gibbons Bros., Ltd.	180
Glover, Thos., & Co., Ltd.	188
Harris & Pearson, Ltd.	Cover IV
Holmes, W. C., & Co., Ltd.	Cover I, 211
Humphreys & Glasgow, Ltd.	186
Hyde, Silas, Ltd.	208
Keith Blackman, Ltd.	212
Kleenoff Co.	210
Lane, George & Sons	209
Londex, Ltd.	210
London Electric Firm	209
Main, R. & A., Ltd.	204
Mewburn, Ellis & Co.	210
Parkinson Stove Co., Ltd.	197
Parkinson, W., & Co.	188
Pass, E., & Co.	184
Peebles & Co., Ltd.	181
Pegson, Ltd.	Cover II
Radiation, Ltd.	198, 199
Reavell & Co., Ltd.	178
Slingsby, Walter, & Co., Ltd.	209
South Metropolitan Gas Company	205
Spencer (Melksham), Ltd.	182
Strachan & Henshaw, Ltd.	210
Trotter, Haines & Corbett, Ltd.	210
Turbine Furnace Co., Ltd.	181
Walker, C. & W., Ltd.	184
Wells, A. C. & Co., Ltd.	178
West's Gas Improvement Co., Ltd.	206
Williamson Cliff, Ltd.	Cover IV
Wilson (George) Gas Meters, Ltd.	183
Woodall-Duckham Co., Ltd.	193
Wright, Alex., & Co., Ltd.	179

Appointments Vacant and Wanted	210
Contracts Open	210
Patents	210
Plant, &c.	210
Plants, &c., Wanted and for Sale	209

A.R.P.

PROTECTION OF SANDBAGS.

METRO CREOSOTE EMULSION

METRO COPPER CREOSOTE EMULSION

Both Emulsions conform to the Specification of the Ministry of Home Security Memorandum A.R.P. 279/1939 — 20/10/39, and are available in GREEN at slight additional cost.

SOUTH METROPOLITAN GAS CO.

Evacuation Address:

COVENTRY HALL,
STREATHAM, S.W.16.

Telephone: STReatham 7771, Exten. 8

For every size of works and every class of coal...

WEST'S

CARBONIZING PLANTS

GLOVER-WEST VERTICALS

WESTVERTICAL CHAMBERS

440 carbonizing plants have been built or are under construction by West's in 24 countries. Working results from a wide variety of gas coals have established the high efficiency and adaptability of the West systems:

WEST'S

GAS IMPROVEMENT CO · LTD ·

MILES PLATTING MANCHESTER 10

TELEPHONE—COLLYHURST 2961-2-3-4-5 · TELEGRAMS—STOKER, MANCHESTER

LONDON OFFICE TEMPORARY ADDRESS—BATH ROAD · HARMONDSWORTH · WEST DRAYTON · MIDDLESEX TEL.—WEST DRAYTON 2288-9

GAS STOCKS AND SHARES

The feature of Stock Exchange business last week was the heavy increase in activity in home rails. Some speculative buying took place in anticipation of the proposed addition to fares, and although before the close a certain amount of profit-taking was in evidence prices retained most of the advances made during the week. The volume of business in gilt-edged stocks was consequently on a reduced scale, although quotations closed at about the same levels as a week ago. Most of the leading industrial shares continued firm, but oils and rubbers were idle.

It is regretted that owing apparently to postal difficulties the various official lists have not arrived in time to give the latest stock quotations in the Gas Market, nor is it possible to comment on the volume of business done in this section.

It will be remembered that reference was made in last week's Report to the severe falls in value which had taken place in Gas Stocks since the outbreak of war, and the following list of some of the leading "ordinaries" illustrates the extent of these depreciations:

	Prices.		
	Pre-War.	Present.	Fall.
Alliance & Dublin	130	107	23½
Bournemouth 7%	148½	105	43
British	105	80	25
Croydon Sliding Scale	123½	87½	36
Gas Light Units	18s. 9d.	14s.	4s. 9d.
Imperial Continental	105	37½	67½
Portsmouth	137	99½	37½
South Eastern Gas Corpn.	21s.	10s.	11s.
South Metropolitan	77½	55½	22
Tottenham	100½	73	27½
Wandsworth	109½	67	42½
Watford	109½	90½	19

Quotations on the London and Provincial Stock Exchanges

OFFICIAL LIST

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 18.	Rise or Fall on Week
1,767,439	Sept. 16	7	7	Alliance & Dublin Ord.	102—112	...
374,000	July 1	4	4	Do. 4 p.c. Deb.	90—95	...
957,608	May 13	5	5	Asscd. Gas & Water U'd'ts Ord.	12/—14/	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	15/6—17/6	...
535,545	,,	4	4	Do. 4 p.c. Red. Cum. Pref.	14/6—16/6	...
136,646	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	12/—14/—	...
561,370	Aug. 12	7	7	Barnet Ord. 7 p.c.	100—105	...
300,000	Oct. 14	1/9⅗	1/4⅘	Bombay, Ltd.	19/6—21/6*	...
690,407	Aug. 19	7	7	Bournemouth 7 p.c. max.	100—110	...
362,025	June 17	4	4	Do. 4 p.c. Deb.	75—85	...
659,955	Aug. 19	6¾	4⅘	Brighton, &c., 5 p.c. Con.	65—75	...
855,000	Sept 30	8	6	Brit. Gas Light Ord.	75—85	...
545,000	June 17	5½	5½	Do. 5½ p.c. 'B' Cum. Pref	110—115	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb.	75—80	...
10,000	Nov. 6, '33	6	4	Cape Town, Ltd., 4½ p.c. Cu. Pf.	¼—¾	...
626,860	July 15	5⅗	6	Cardiff Con. Ord.	89—94	...
24,500	Sept. 23	7	7	Colombo Ord. 7 p.c. Pref.	19/—21/—	...
764,169	Oct. 7	-/11.48	-/11.48	Colonial Gas Assn. Ltd. Ord.	14/—16/—	...
400,000	,,	1/3.30	1/3.30	Do. 8 p.c. Pref.	19/—21/—	...
1,748,935	July 22	2	3	Commercial Ord.	37—42	...
620,000	June 10	3	3	Do. 3 p.c. Deb.	58—63	...
286,344	Aug. 19	5	5	Do. 5 p.c. Deb.	88—93	...
807,560	Aug. 12	7	6	Croydon sliding scale	85—90	...
644,590	,,	5	5	Do. max. div.	90—85	...
620,385	July 1	5	5	Do. 5 p.c. Perp. Deb.	90—95	...
179,500	Aug. 19	5⅖	5	East Surrey 'B,' 5 p.c.	75—80	...
176,461	June 17	5	5	Do. 5 p.c. Deb. (Irred.)	90—95	...
250,000	July 8	4	6	Gas Consolidation Ord. 'B'	13/6—14/6	...
250,000	May 13	4	4	Do. 4 p.c. Red. Cum. Pref.	15/—17/—	...
19,152410	July 29	3⅜	4½	Gas Light & Coke Ord.	13/—15/—a	...
2,600,000	,,	3½	3½	Do. 3½ p.c. max.	54—59	...
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref.	70—75	...
2,993,000	July 8	3¾	3¾	Do. 3¾ p.c. Red. Pref.	80—85	...
8,602,497	June 3	3	3	Do. 3 p.c. Con. Deb.	65—70	...
1,642,770	,,	5	5	Do. 5 p.c. Red. Deb.	99—104	...
3,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb.	98—103	...
700,000	Sept. 9	3½	3½	Do. 3½ Red. Deb.	80—85	...
3,600,000	May 13	4	8	Imperial Continental Cap.	35—40	...
43,820	July 29	3½	3½	Do. 3½ p.c. Red. Deb.	63—68	...
231,978	Aug. 19	5	5	M.S. Utility 'C' Cons.	68—73	...
918,657	,,	4	4	4 p.c. Cons. Pref.	72—77	...
675,000	May 6	†4	†4	Montevideo, Ltd.	52—57	...
300,000	Apl. 29	9	7	Oriental, Ltd.	100—110	...
368,537	June 3	7	8	Plymouth & Stonehouse 5 p.c.	90—100	...
621,667	Aug. 19	8½	7½	Portsmouth & Gosport Cons.	97—102	...
648,999	Sept. 16	1/1	1/1½	Severn Val. Gas Cor. Ld. Ord.	13/—15/—	...
597,972	,,	-/10½	-/10½	Do. 4½ p.c. Cum. Pref.	15/6—17/6	...
2,528,714	Sept. 2	1/—	-/7½	South East'n Gas Cn. Ld. Ord.	9/—11/—	...
1,000,000	,,	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	14/—16/—	...
1,068,869	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	13/—15/—	...
6,709,895	Aug. 5	4	4	South Met. Ord.	53—58	...
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pref.	95—105	...
850,000	,,	4	4	Do. 4 p.c. Irred. Pref.	65—75	...
1,895,445	July 1	3	3	Do. 3 p.c. Perp. Deb.	60—65	...
1,000,000	July 15	5	5	Do. 5 p.c. Red. Deb.	95—100	...
1,543,795	July 22	3	4	South Suburban Ord. 5 p.c.	60—70	...
512,825	July 8	5	5	Do. 5 p.c. Perp. Pref.	88—93	...
500,000	,,	4	4	Do. 4 p.c. Perp. Pref.	65—70	...
250,000	,,	3¾	3¾	Do. 3¾ p.c. Red. Pref.	80—85	...
888,587	June 10	5	5	Do. 5 p.c. Perp. Deb.	90—95	...
750,541	Aug 9	5½	5	Southampton Ord.	58—63	...
350,000	Feb. 12	5½	5½	Swansea 5½ p.c. Red. Pref.	91—96	...
1,076,495	Aug. 5	5	5	Tottenham & District Ord.	68—78	...
338,555	,,	5	5	Do. 5 p.c. Pref.	93—98	...
453,380	June 10	4	4	Do. 4 p.c. Perp. Deb.	78—83	...
1,247,505	May 20	4	6	U. Kingdom Gas Cor. Ord.	12/—14/—	...
1,085,952	May 13	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	13/6—15/6	...
772,709	,,	4	4	Do. 4 p.c. 1st Red. Cum. Pref.	13/—15/—	...
745,263	June 17	4½	4½	Do. 4½ p.c. 2nd Non. Cum. Pf.	12/6—14/6	...
1,200,000	Sept. 9	3½	3½	Do. 3½ p.c. Red. Deb.	82—87	...
380,608	Aug. 5	7	6⅔	Uxbridge, &c., 5 p.c.	80—90	...
1,371,138	July 8	3½	4	Wandsworth Consolidated	62—72	...
2,525,768	,,	4	4	Do. 4 p.c. Pref.	60—70	...
1,343,964	June 17	5	5	Do. 5 p.c. Deb.	90—95	...
383,745	,,	4	4	Do. 4 p.c. Deb.	80—85	...
358,342	July 15	6	5	Watford & St. Albans Ord.	88—93	...
300,000	June 10	3½	3½	Do. 3½ p.c. Red. Deb.	85—90	...

SUPPLEMENTARY LIST

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Oct. 18.	Rise or Fall on Week.
351,685	June 17	5	5	Brighton, &c., 5 p.c. Perp. Deb.	90—95	...
28,700	,, 17	5½	5½	Do. 5½ p.c. Red. Deb. 1942	96—101	...
415,250	,, 17	4	4	Bristol Gas Co., 4 p.c. New Deb.	85—90	...
140,205	July 29	7	7	Cambridge, &c., 7 p.c. Cons. 'B'	100—110	...
295,932	Aug. 19	5	5	Cheltenham, 5 p.c. Cons. Ord.	88—93	...
42,500	July 1	4	4	Do. 4 p.c. Perp. Deb.	82—87	...
150,000	Aug. 12	4	4	Croydon Gas, 4 p.c. Pref. (Irr.)	70—75	...
130,000	July 1	4	4	Do. 4 p.c. Deb.	75—80	...
146,700	Aug. 19	5½	5½	East Surrey, 5½ p.c. Pref. 'A'	90—95	...
53,220	,, 19	6	6	Do. 6 p.c. Cum. Pref.	95—100	...
117,425	Feb. 5	8	8	East Wight, 5 p.c. Cons. Ord.	100—110	...
...	Aug. 19	6	4	Eastbourne, 'B' 3½ p.c.	65—75	...
239,135	July 8	5	5	Gas Consolidation 'A' Ord. (£1)	13/6—15/6	...
156,600	Aug. 19	5	5	Hampton C't, 5 p.c. Cons. Ord.	68—73	...
18,000	June 10	7	7	Malta & Med'n., 7 p.c. 1st Pref.	60—65	...
10,845	,, 10	7½	7½	Do. 7½ p.c. 2nd Pref.	60—65	...
50,000	Aug. 19	£5 19 6	£5 4 6	Mid. South. Util., 'A' Cons. 5 p.c.	63—73	...
65,000	Aug. 12	5	5	North Middlesex, 5 p.c. Pref.	85—90	...
70,000	Sept. 9	5	5	Plymouth & Stone., 5 p.c. Deb.	87—92	...
76,501	July 1	4	4	Reading, 4 p.c. Perp. Deb.	75—80	...
74,777	Sept. 30	4	4	Romford, 4 p.c. Debs. (Reg.)	77—82	...
21,000	June 10	5	5	Slough, 5 p.c. Perp. Deb.	90—95	...
211,740	,, 17	5	5	Southampton, 5 p.c. Red. Deb.	96—101	...
363,575	July 1	5	5	Tottenham, 5 p.c. Reg. Red. Mt.	95—100	...
202,019	Oct. 14	6½	6¾	Tunbridge Wells, 4 p.c. Scale	70—80*	...
135,257	June 10	5	5	Uxbridge &c., 5 p.c. Perp. Deb.	90—95	...

PROVINCIAL EXCHANGES

47,756	July 26	6	5	Bath Cons.	98—103	...
122,577	July 22	7	6	Blyth 5 p.c. Ord.	100—105	...
1,667,250	July 15	5	5	Bristol, 5 p.c. max.	87—90	+1
120,420	June 17	4	4	Do. 1st 4 p.c. Deb.	94—96	...
415,250	,,	4	4	Do. 2nd 4 p.c. Deb.	92—95	...
328,790	,,	5	5	Do. 5 p.c. Deb.	108—111	...
157,150	Aug. 5	6½	5	Chester 5 p.c. Ord.	98—101	...
92,500	June 17	4	4	Do. 4 p.c. Pref.	80—85	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	80—85	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb.	94—98	...
542,270	Aug. 12	9	6	Derby Cons.	100—105	...
55,000	June 10	4	4	Do. 4 p.c. Deb.	96—102	...
10,000	Aug. 19	10	10	Great Grimsby 'A' Ord.	170—180	...
6,500	,,	10	10	Do. 'B' Ord.	170—180	...
79,000	,,	10	10	Do. 'C' Ord.	160—170	...
732,000	Aug. 26	4	4	Hartlepool G. & W. Cn. & New	63—68	...
2,167,410	Aug. 19	6	6	Liverpool 5 p.c. Ord.	96—98	...
245,500	June 17	5	5	Do. 5 p.c. Red. Pref.	97½—100½	...
306,083	July 15	4	4	Do. 4 p.c. Deb.	99—101	...
20,000	June 24	5	5	Long Eaton 5 p.c. Pref.	9—11	...
80,000	June 24	5	5	Do. 5 p.c. Deb.	100—105	...
2,430,267	July 29	5 7/10	5	Newcastle and Gateshead Con.	15/9—16/9a	...
682,856	,,	4	4	Do. 4 p.c. Pref.	74—76	...
776,706	Dec. 27	3½	3½	Do. 3½ p.c. Deb.	80—85	...
277,285	April 24	5	5	Do. 5 p.c. Deb. '43	97—102	...
274,000	July 26	5	5	Newport (Mon.) Ord.	89—93	...
13,200	Sept. 16	8½	7	Pontyp'l Gas & W. 10 p.c. 'A'	11½—12½	...
13,600	,,	6	5	Do. 21 7 p.c. 'B'	9½—10½	...
40,000	,,	5	6	Do. 7 p.c. 'C'	9½—10½	...
106,280	Aug. 5	8	10	Preston 'A' 10 p.c.	157—167	...
188,219	,,	7	7	Do. 'B' 7 p.c.	113—123	...
1,806,339	Aug. 26	6½	6½	Sheffield Cons.	118—120	...
95,000	July 8	4	4	Do. 4 p.c. Deb.	97— 99	...
332,351	Feb. 5	6	6	Sunderland 6 p.c. max.	107—112	...
140,778	Aug. 12	5	5	Weston-super-Mare Cons.	80—85	...
64,338	June 24	4	4	Do. 4 p.c. Deb.	75—85	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb.	137—145	...

a.—The quotation is per £1 of Stock. * Ex. div. † Price free of income-tax.

There is no better way of searching out faulty meters than house to house testing with an

"A & M"

DRY TEST METER

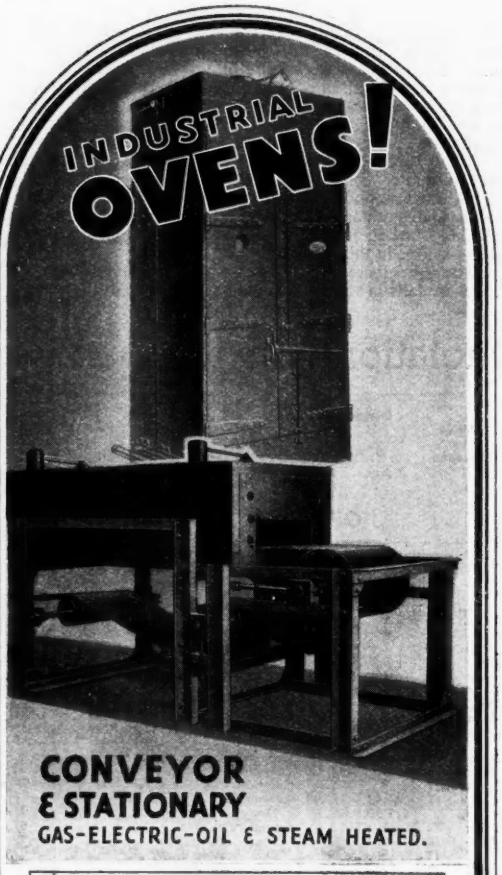
"A & M" Dry Test Meters are made in 40, 100 and 200 cubic feet sizes—the 40 cubic feet size weighing only 13½ lbs. Leather handles are fitted for ease of carrying.

The pointer shows the hourly rate by a minute's observation on the outer circle and 1 cubic foot in 100th parts on the inner.

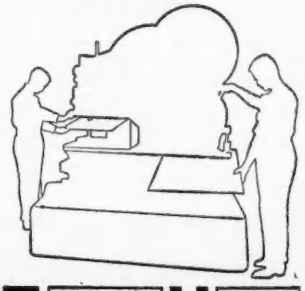
We also manufacture Dry Demonstration Meters for Showroom use.

ALDER & MACKAY LTD.

EDINBURGH - LONDON - BRADFORD & BRANCHES



REMEMBER WHO MAKES THEM....



SILAS HYDE
LIMITED
BIRMINGHAM, 11

SILAS HYDE LIMITED
GREET WKS. EVELYN ROAD BIRMINGHAM,11

CONTENTS

EDITORIAL NOTES

Appliance Research in America .. 235
Machine Tools for Victory 236
Control of Coal Tar Distribution .. 236

Personal 236
Obituary 236
Letters to the Editor :
Orders for Laboratory Apparatus .. 237
Gas Meter Supply 237
Analysis of Coal and Coke 237
" Gas Journal " Directory 237
A Self-Charging Handlamp 237
Electro-Magnetic Relays 237
New Methods of Joining Cables .. 237
Let's See What's Inside 237
A Testimonial 237

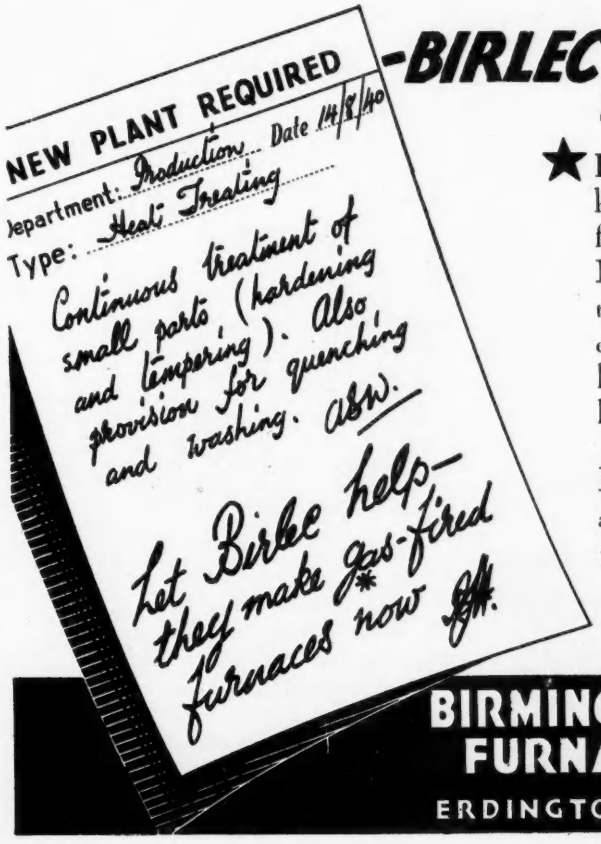
Thoughts on Coke. By W. L. Boon .. 238
Industrial Lighting in Wartime. By H. C. Weston 243
Heating of Air-Raid Shelters 249
By-Products of Coal Carbonization. By John M. Weiss 250
Finance of Co-ordination in the Gas Industry. By Colin Graham .. 251
Gas in New South Wales Sports Club .. 253
Useful Tables 253
Gas Undertakings Results 253

Gas Products Prices 255
Gas Stocks and Shares 257
Stock and Share Lists 257

TERMS OF SUBSCRIPTION.—*United Kingdom and Ireland : Advance Rate 35/- per annum ; 18/- per half year. Credit Rate : 40/- per annum ; 21/- per half year. Dominions and Colonies and United States : 35/- per annum, in advance. Other Countries in the Postal Union, 40/- per annum, in advance. A copy of the " G.J." Calendar and Directory is presented to continuous subscribers.*

CLASSIFIED ADVERTISEMENTS.—*Situations Wanted, 6d. a line (minimum 3/-, about 36 words). Situations Vacant, Plant for Sale and Wanted Contracts, Public Notices, Educational, &c., 9d. a line (minimum 4/6). Financial Notices, 1/- per line. Box Number, 6d. extra. WALTER KING, LTD., 51, High Street, Esher, Surrey. Telephone : Esher 1142.*

Advertisement Index, see p. 255.


NEW PLANT REQUIRED
Department: Production Date 14/8/40
Type: Heat Treating
Continuous treatment of small parts (hardening and tempering). Also provision for quenching and washing. ASW.
Let Birlec help— they make gas-fired furnaces now ffff.

-BIRLEC *for* **Gas-fired Furnaces**

★ For many years BIRLEC electric furnaces have been used with increasing reputation for all types of heat treatment processes. Recently gas-fired furnaces have been added to our range and, since they embody all the established advantages of BIRLEC design, have already been supplied for a variety of heat-treatment requirements.

BIRLEC'S long experience in the design and construction of furnaces of all types is at your service.

BIRMINGHAM ELECTRIC FURNACES LIMITED
ERDINGTON BIRMINGHAM 24
BIRLEC

for

mechanically-lubricated

meters

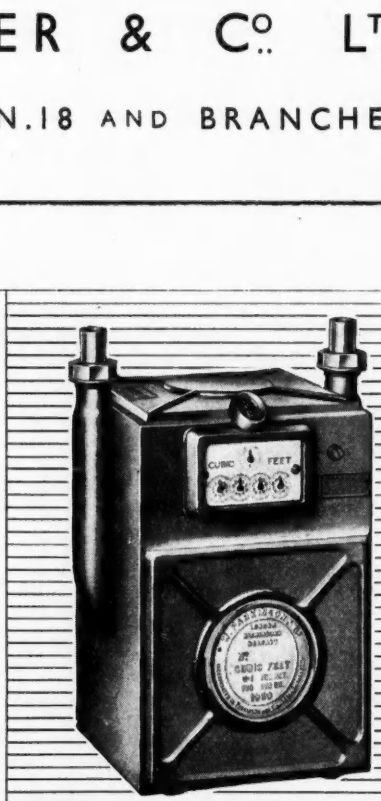
THOMAS GLOVER & Co. LTD.

EDMONTON, LONDON, N.18 AND BRANCHES

PARKINSON

The Meter with over 120 years' reputation . . .

ESTABLISHED 1816



W. PARKINSON & CO.
(Incorporated in Parkinson & Cowan (Gas Meters) Ltd.)
COTTAGE LANE WORKS, CITY ROAD, LONDON, E.C.1
Iron Lane, Stechford, Birmingham, 9
Raphael Street Works, Cromac Street, Belfast

p.5